

Heather.

By the Late FRANK ELGEE, Ph.D.

(Mrs Elgee states that this paper was written in a wet summer in the late twenties or early thirties and certainly before 1938 when they left the north.)

Despite the wet summer, perhaps because of it, the Heather, at any rate on the North Yorkshire Moors has this August borne a wealth of blossom the like of which has not been seen for some years. Given a little sunshine and the spectacle will more than compensate drenching rains and cold north-westers which have lately been our lot on the moors. Now that the curtain of wet, fog and cloud is lifting, the special glory of this season's Heather is becoming more and more manifest. For hundreds of square miles the earth is robed in a marvellous purple garment. The bloom is so profuse that there is a complete lack of that patchiness so conspicuous in less favourable Heather years; the colour is richly and intensely uniform, the most wonderful display of flower decoration in the British Isles,

I have often wondered whether the moors would have been more beautiful had they been clothed in white Heather. Had this been on our August moorlands. instead of glowing generously like wine, would have suggested the continuity of winter in the chilly, white expanse And an equal mixture of purple and white, fringed with the deep green of bracken, would hardly be so imperial as the wide sweeps of unbroken purple. Among the many mysteries which the moors suggest that of the colour of the Heather is the most mysterious. Why should it be purple instead of white? I refer not merely to the fact that the flower is conspicuously coloured so as to attract insects but to its deeper significance as the expression of the inner meaning of the moors, a meaning which the more we seek after the more it appears to elude us.

Consider the wealth of blossom for a moment. I counted forty flowers within a square inch selected at random. From this figure I calculated that on the three-hundred square miles of moorland in North-East Yorkshire there must be over 40 billions of flowers. Such a figure is comparable only to those familiar to us in astronomical works; roughly speaking, it is about two flowers for every mile of the distance of the nearest star. And it is but a fraction of the total number of flowers now in bloom throughout Britain and the Continent. The bounds of our understanding are left far behind if we multiply 40 billions by 5000, the last figure being a modest estimate of the number of years in which the Ling has bloomed on the East Yorkshire moors alone

Like the rest of the plant, Heather bloom is dry, tough and wiry, besides being very firmly attached to the stalks. These qualities are undoubtedly the best the flowers could have when we reflect on their conditions of life. Suppose the flowers to have been tender, moist and pliable, loosely attached. Then comes the summer north-wester driving the pitiless rain over the unsheltered moors—and the blossom would have been blighted immediately. Thanks to their toughness, however, the flowers are none the worse for the awful weather we have had on the hills; if anything they are more glowing and fresher for the washings and buffetings they have received, like a girl's cheeks after a whipping by rain.

Fertilisation in Heather is effected by the visits of bees and other insects as well as by a flower's pollen falling on its own stigma. When the sportsman tramps through the ripe bloom, pollen rises in fragrant clouds, and this likewise falls on the myriad stigmas ready to receive it, After pollination as the sepals and petals fade, they close round the style, leaving it to project like a small pin stuck in the middle of a square purple pin-cushion.

Doubtless, this enclosure of the seed-box or capsule by the dead flower is to prevent the young green seed from wilting, a constant menace to the whole plant owing to the small amount of moisture it contains and in the strong winds which blow eternally over the exposed moors. At any rate, the dead flowers persist until the minute seeds, 4-8 in number, are ripe, when they fall to the ground or the wind scatters them far and wide.

If we multiply the foregoing 40 billions by 8 we shall have an inadequate idea of the quantity of seed produced on a given area. Such prodigality indicates a vast destruction of seed and seedlings, and probably not a tithe of the seeds produced ever grows to maturity. Myriads must perish through settling on ground unsuited to their requirements and it is a fact worth reflecting on that in gardens near the moors, Heather rarely or never springs up as a weed. Yet the wind must carry innumerable seeds into such gardens.

Heather, transplanted into gardens, will live for a time and then gradually die down unless provided with fresh moory soil. This is because it is a very abstemious plant; it can live on very little and it can only absorb small quantities of food at a time. Planted in a garden Heather is much in the position of a man accustomed to scanty fare suddenly eating sumptuous banquets day after day. If the rich fare does not kill him it will certainly make him ill, and he can only recover by going on short commons again.

It is this peculiarity that enables Heather to flourish generation after generation on the same spot. Moor soil is poor in plant food, and this is in such a form as to be difficult of assimilation by the roots. Consequently, big, hungry, quick-growing plants like weeds cannot live on moors. But the abstemious Heather is like a man compelled to live for years on a very small stock of food: if he eats a little every day, if he strictly rations himself he can keep alive. Were he to devour it in a few meals he would quickly die of starvation. Now there can be little doubt that Heather has flourished on the North Yorkshire moors for thousands of years, ever since the close, if not before and during the Ice Age itself. And it has been able to do this simply because of the small food ration to which it has become so marvellously adapted. Of course during this long period, the soil would have become exhausted of plant food had not the moorland plants by their death and decay restored to the soil part of what they had taken from it during life. The droppings of the grouse, too, have no doubt helped to manure the and prevent it from becoming even poorer than it is.

Another peculiarity of Heather (the plant is a wonderful mass of peculiarities) is its dryness. Clearly, the roots cannot absorb much water. And this seems to be due to injurious substances in moorland water, especially peaty water, the exact nature of which is a most obscure problem. It would appear, however, that Heather can drink very little even when living on soaking bogs where its position is somewhat like that of the Ancient Mariner: "With water, water everywhere nor any drop to drink." With this difference, however, that whilst the Mariner drank what could from passing showers, Heather absorbs what it can of the water. In this water its mineral food is dissolved, and it is likely that before this can be used by the plant it has to be made harmless acceptable by a friendly fungus which helpfully lives on and among root-hairs.

Naturally, if Heather absorbs so little liquid, it cannot afford to lose that little; and it would lose it if it had large leaves, for it is from these, leaves that plants exhale or transpire water as invisible vapour, a process which can be unduly hastened by sunshine and wind.

Now Heather leaves are most minute, barely more than 1/16th of inch long; they overlap one another closely like tiles; they are so what boat-shaped with the hollow turned towards the stem, the keel of one leaf fitting into the hollow of the one below. Besides which the green cuticle is thicker on the keel and thinner in the hollow where transpiration pores are hidden. In this artful way excessive lost water is checked. No matter how strong the wind or how hot the sun the pores are never directly exposed to their withering influence and the plant remains fresh and green..

But to make up for the reduction in area, the leaves are exceedingly numerous down four sides of the stem. Had they been few small, the plant would have run the risk of perishing altogether. the leaves, even if able to transpire sufficiently, would then have unable to abstract enough carbon from the atmospheric carbonic gas for the plant's needs. Hence the necessity for the marvellous adjustment to the surrounding conditions—a small leaf with a special structure to prevent wilting and a great number of leaves to ensure the important life-function and ensuring that transpiration and absorption of carbon are not interfered with.

In its way Heather is as perfectly adapted to a moorland life like the Grouse. But the conditions are not so self-evident with the plant as with the bird. The shrubby growth of Heather, its tough, wiry sit and firmly embedded underground parts are a general adaptation to wind-swept haunts. In North Yorkshire, for instance, where the in cover a high tableland exposed to every quarter and with no peal check it, the wind often blows, with such force that pines growing low the moor edge have been torn up by the roots, lifted bodily flung violently on to the level of the tableland itself. But our old friend the Heather, merely bows to the gale and lives to enjoy its important life of summer splendour and winter hardship for a full score years,